

West Nile virus and other arboviral activity -- United States, 2012
Provisional data reported to ArboNET
Tuesday, August 14, 2012

This update includes provisional data reported to ArboNET for **January 1–August 14, 2012** for nationally notifiable arboviral diseases caused by West Nile, Eastern equine encephalitis, La Crosse, Powassan, and St. Louis encephalitis viruses. Dengue cases are reported in a separate update available from the CDC Dengue Branch. For additional information about ArboNET and arboviral disease resources, see page 11.

West Nile virus (WNV) activity in 2012

As of August 14th, 598 counties from 43 states have reported WNV activity to ArboNET for 2012, including 32 states with reported WNV human infections (i.e., disease cases or presumptive viremic blood donors) and 11 additional states with reported WNV activity in non-human species only (i.e., veterinary cases, mosquito pools, dead birds, or sentinel animals) [Figures 1 and 2].

Figure 1. West Nile virus (WNV) activity reported to ArboNET, by state, United States, 2012 (as of August 14, 2012)

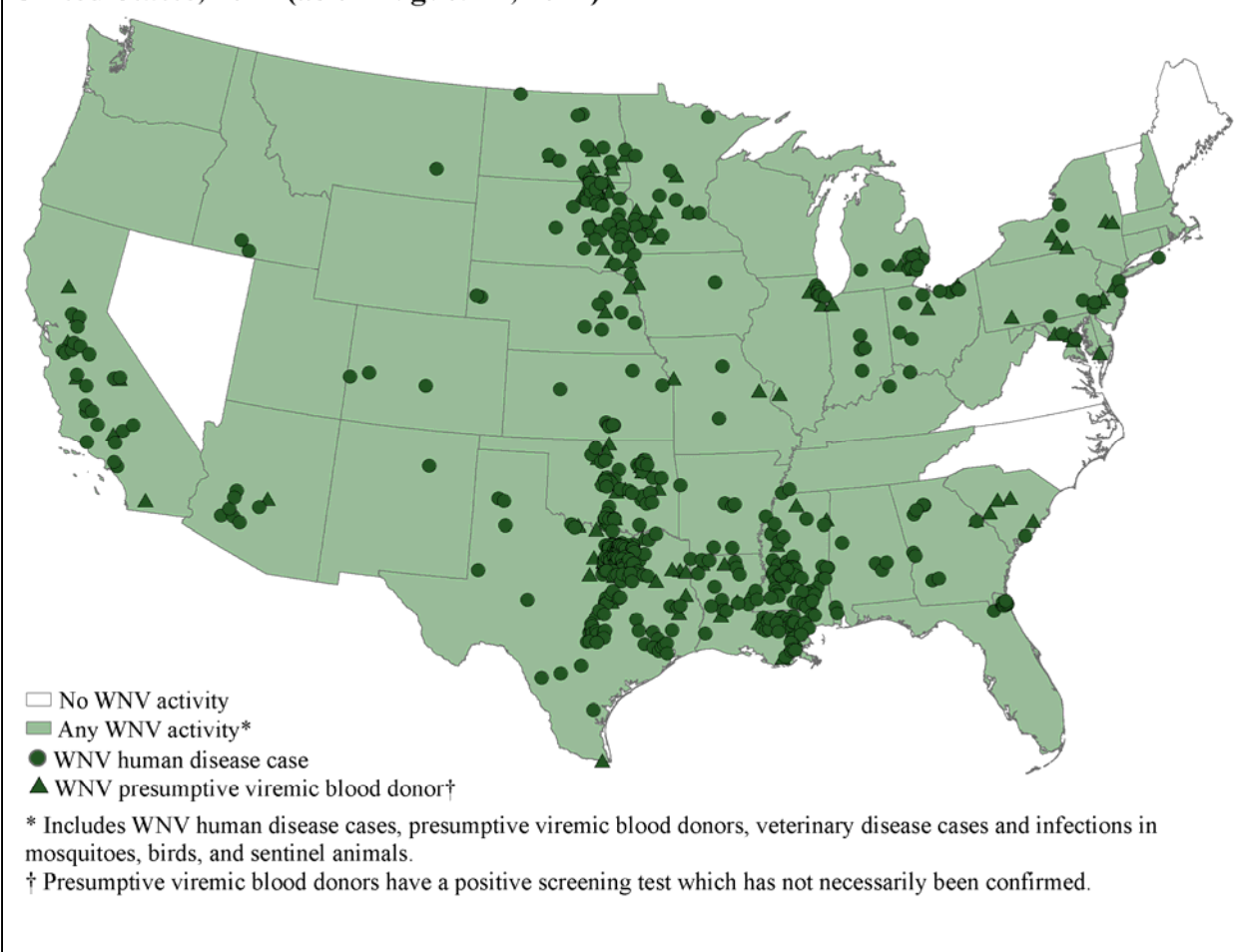
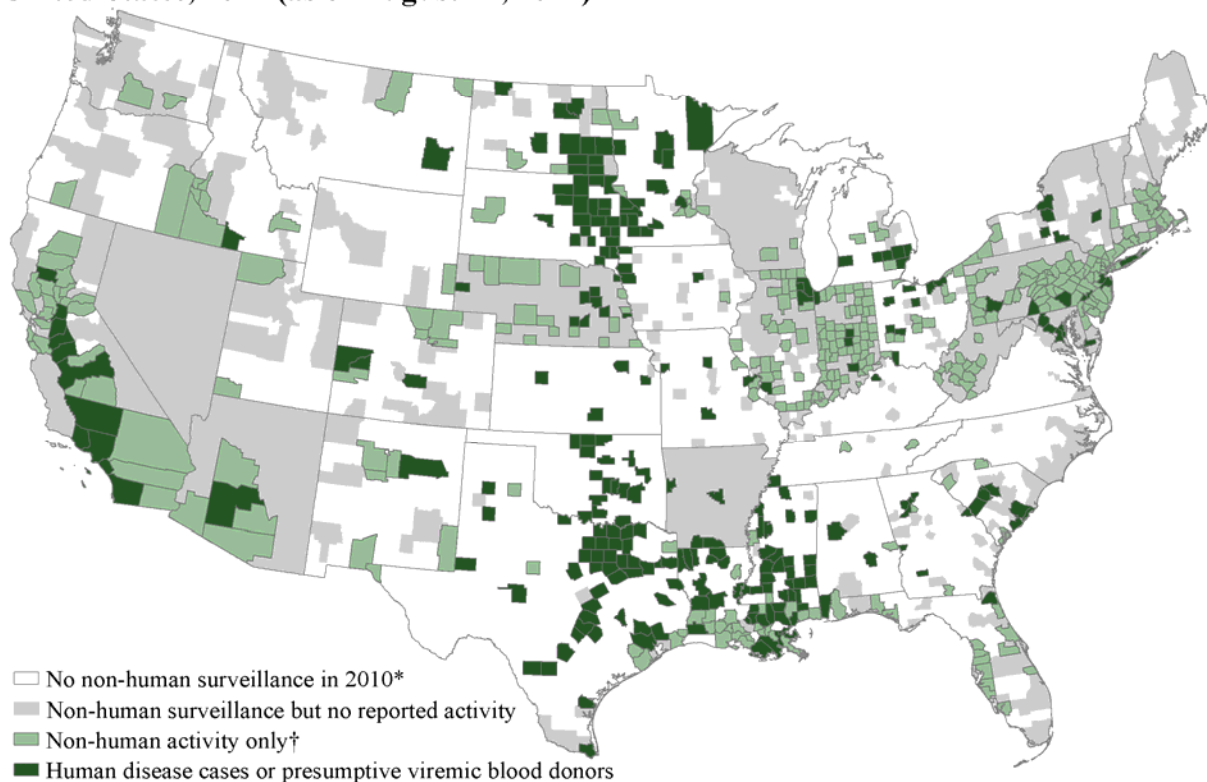


Figure 2. West Nile virus (WNV) activity reported to ArboNET, by county, United States, 2012 (as of August 14, 2012)



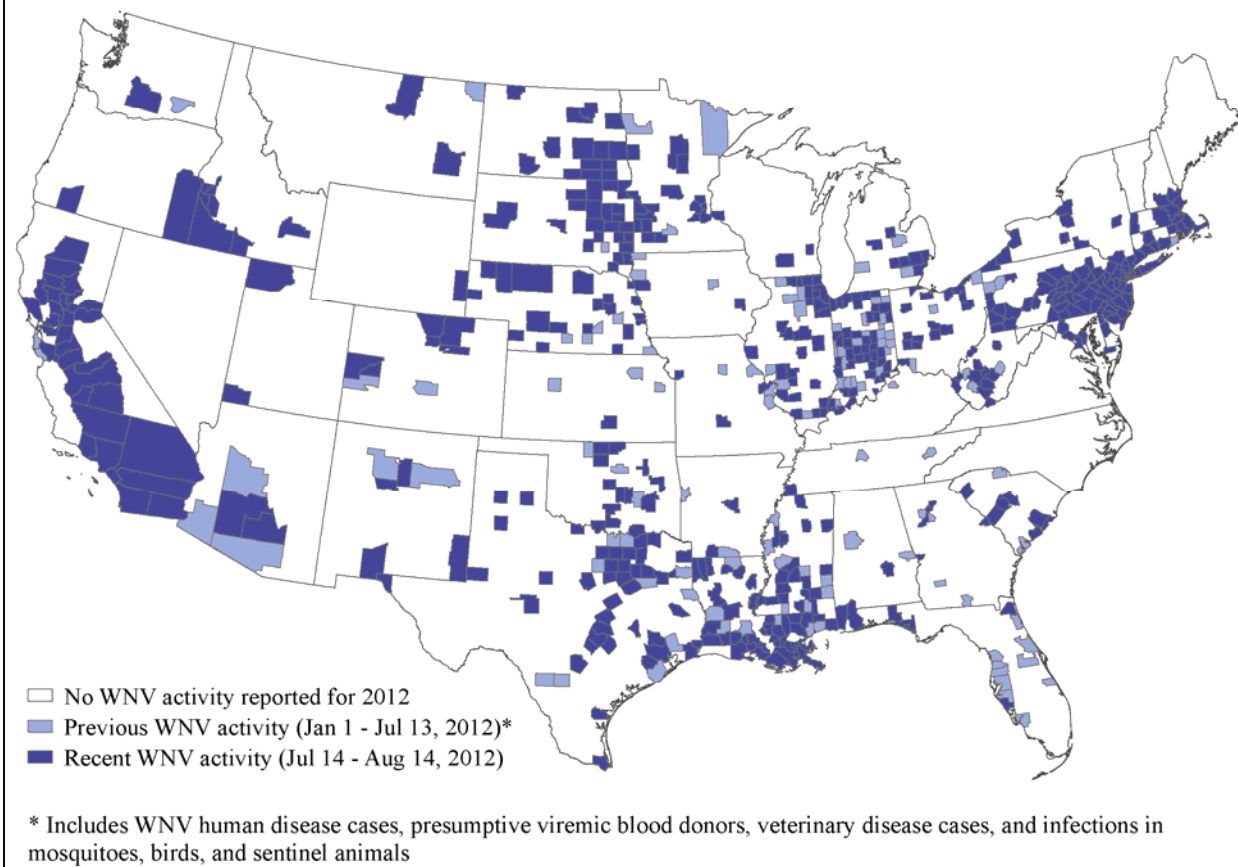
* As reported by state health departments in a survey conducted in October 2010. Surveillance for human disease and presumptive viremic blood donors is performed in all counties.

† Includes WNV veterinary disease cases and WNV infections in mosquitoes, birds, and sentinel animals.

Recent WNV activity in 2012

During the past month (July 14 – August 14), WNV activity has been reported from 476 counties in 43 states [Figure 3].

Figure 3. West Nile virus (WNV) activity reported to ArboNET, by time period and county, United States, 2012 (as of August 14, 2012)



WNV human infections reported for 2012

Reported WNV disease cases

To date, 693 human cases of WNV disease have been reported from 202 counties in 32 states [Table 1]. Of all WNV disease cases reported, 406 (59%) were classified as neuroinvasive disease (e.g., meningitis, encephalitis, acute flaccid paralysis) and 287 (41%) as non-neuroinvasive disease. Dates of illness onset for disease cases ranged from April–August [Figure 4]. Additional demographic and clinical characteristics of reported cases are provided on page 10 [Table 5].

Estimated WNV disease cases

Based on previous studies, for every reported case of WNV neuroinvasive disease, there are an estimated 28–70 non-neuroinvasive disease cases. Extrapolating from the 406 WNV neuroinvasive disease cases reported, an estimated 11,368–28,420 nonneuroinvasive disease cases might have occurred in 2012. However, only 287 were diagnosed and reported; 1%–3% of non-neuroinvasive disease cases estimated to have occurred.

Presumptive viremic blood donors

A total of 191 WNV presumptive viremic blood donors have been reported from 23 states [Table 1]. Of these, two (1%) developed neuroinvasive disease and 21 (11%) developed non-neuroinvasive disease; these are included in Table 1 as both presumptive viremic blood donors and human disease cases and in Figure 1 as human disease cases.

Comparison to last 5 years (as of the second week in August)

From 2007–2011, an average of 172 cases of human WNV disease (Range: 53–444 cases) was reported through the second week in August. This included an average of 71 neuroinvasive disease cases and 102 non-neuroinvasive disease cases. During these same years, an average of 29 presumptive viremic blood donors (Range 15–49 donors) was reported. The 693 human disease cases reported thus far in 2012 is the highest number of cases reported through the second week of August.

Figure 4. West Nile virus (WNV) human disease cases reported to ArboNET by week of onset, United States, 2012 (as of 08/14/2012)

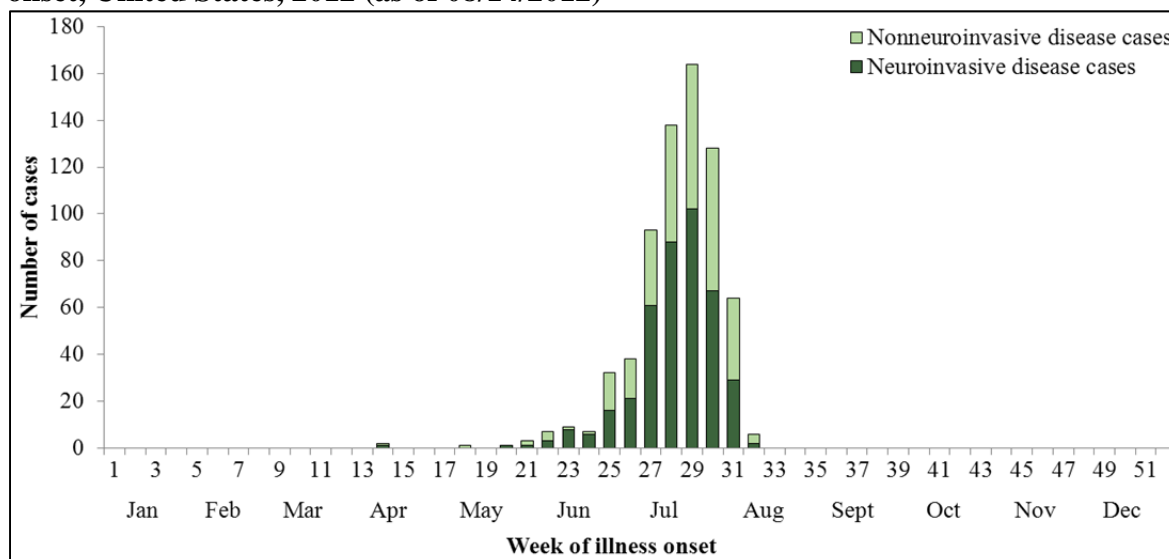


Table 1. Human West Nile virus (WNV) infections reported to ArboNET, 2012 (as of 08/14/2012)

State	Reported human disease cases			Deaths	Presumptive viremic blood donors†
	Neuroinvasive disease cases	Non-neuroinvasive disease cases	Total cases*		
Alabama	3	3	6	--¶	--
Arizona	5	2	7	1	1
Arkansas	6	--	6	--	--
California	12	11	23	1	11
Colorado	1	2	3	--	--
Florida	4	5	9	--	--
Georgia	7	2	9	--	1
Idaho	--	2	2	--	--
Illinois	5	2	7	--	4
Indiana	2	2	4	--	2
Iowa	1	2	3	--	1
Kansas	5	3	8	--	--
Kentucky	1	--	1	--	--
Louisiana	37	15	52	6	14
Maryland	1	1	2	--	5
Michigan	7	5	12	--	6
Minnesota	5	8	13	--	10
Mississippi	33	26	59	1	11
Missouri	2	--	2	1	2
Montana§	--	1	1	--	--
Nebraska	2	6	8	--	2
New Jersey	--	1	1	--	1
New Mexico§	--	1	1	--	1
New York	4	--	4	--	5
North Dakota	4	8	12	--	7
Ohio	7	2	9	--	2
Oklahoma	40	9	49	1	24
Pennsylvania§	3	1	4	--	3
South Carolina	--	1	1	--	5
South Dakota	8	29	37	1	15
Tennessee§	1	1	2	--	--
Texas	200	136	336	14	58
Totals	406	287	693	26	191

*Includes confirmed and probable cases.

†Of the 191 presumptive viremic blood donors, 23 (12%) developed clinical illness and are also included as “Reported human disease cases”.

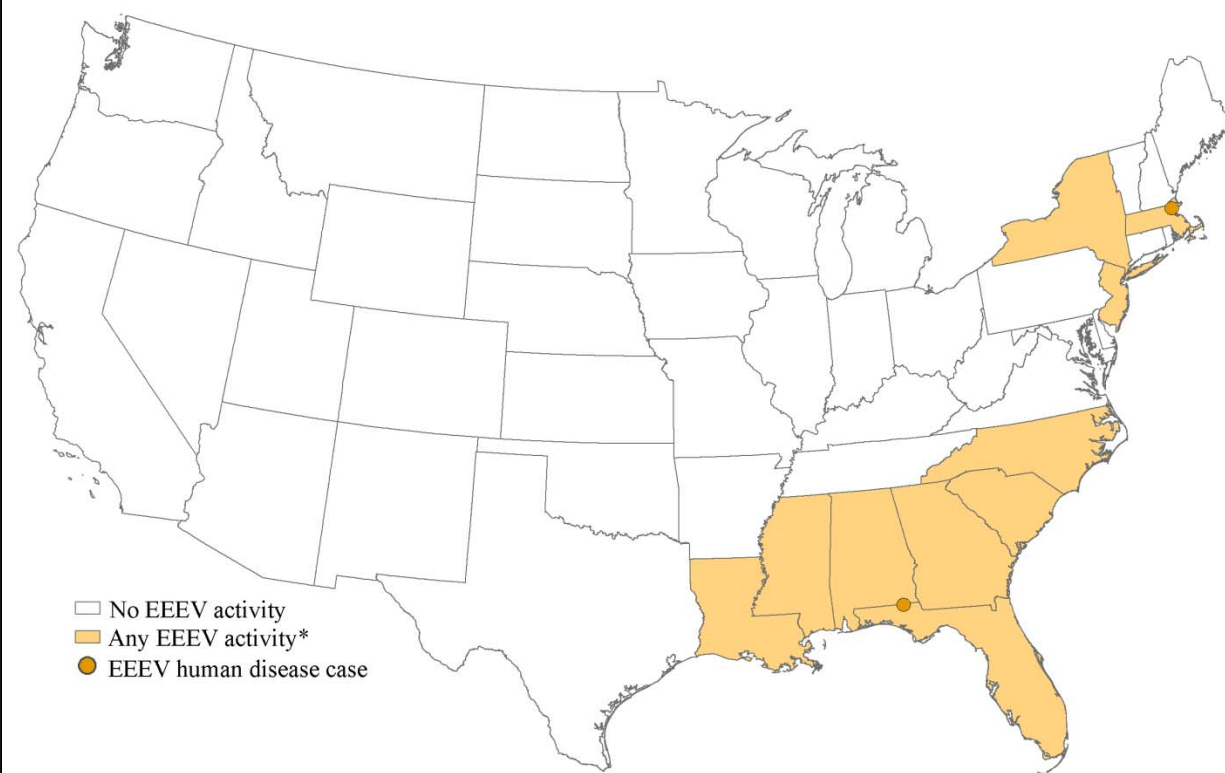
¶None reported.

§Jurisdictions reporting their first WNV human disease cases or PVDs for 2012.

Eastern equine encephalitis virus (EEEV) activity in 2012

As of August 14th, 66 counties in 10 states have reported EEEV activity to ArboNET for 2012, including two states (Florida and Massachusetts) with human cases of EEEV disease and eight additional states with EEEV activity in non-human species only [Figure 5 and Table 2]. During the past month (July 14 – August 14), EEEV activity has been reported in seven states (Florida, Massachusetts, Mississippi, New Jersey, New York, North Carolina, and South Carolina).

Figure 5. Eastern equine encephalitis virus (EEEV) activity reported to ArboNET, by state, United States, 2012 (as of August 14, 2012)



* Includes EEEV human disease cases, veterinary disease cases, and infections in mosquitoes, birds, and sentinel animals.

Table 2. Eastern equine encephalitis virus (EEEV) human disease cases reported to ArboNET, United States, 2012

	Neuroinvasive disease cases	Nonneuroinvasive disease cases	Total cases*	Deaths
Florida	1	--¶	1	--
Massachusetts§	1	--	1	--
Totals	2	--	2	--

*Includes confirmed and probable cases.

¶None reported.

§Jurisdictions reporting their first EEEV human disease case for 2012.

La Crosse virus (LACV) activity in 2012

As of August 14th, 14 counties in six states (Indiana, North Carolina, Ohio, Tennessee, Texas, and West Virginia) have reported LACV activity to ArboNET for 2012; these six states have reported 17 human cases of LACV disease [Figure 6 and Table 3]. Demographic and clinical characteristics of reported cases are described on page 10 [Table 5]. During the past month (July 14 – August 14), LACV activity has not been reported.

Figure 6. La Crosse virus (LACV) activity reported to ArboNET, by state, United States, 2012 (as of August 14, 2012)

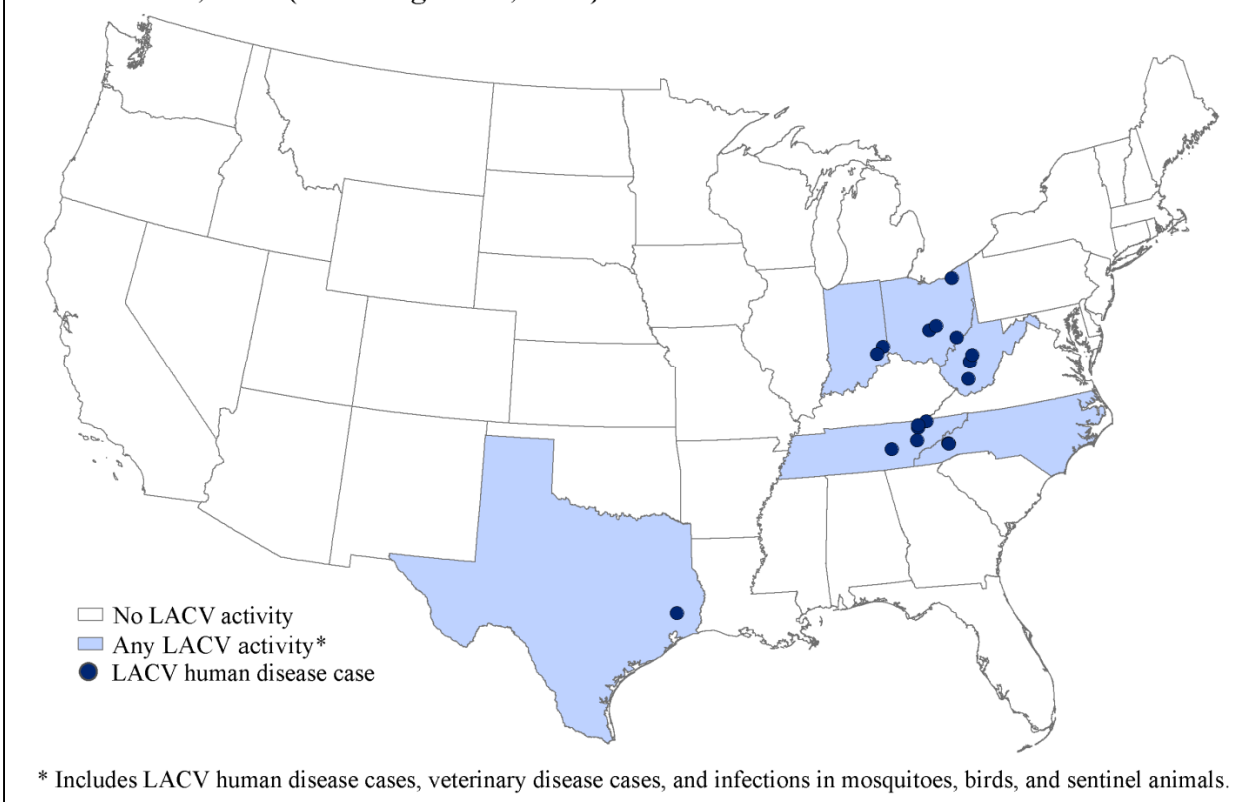


Table 3. La Crosse virus (LACV) human disease cases reported to ArboNET, United States, 2012

	Neuroinvasive disease cases	Nonneuroinvasive disease cases	Total cases*	Deaths
Indiana	1	1	2	--¶
North Carolina	1	1	2	--
Ohio	4	--	4	--
Tennessee	5	--	5	1
Texas	1	--	1	--
West Virginia§	2	1	3	--
Totals	14	3	17	1

*Includes confirmed and probable cases.

¶None reported.

§Jurisdictions reporting their first LACV human disease case for 2012. Dates of onset for these cases were in June and early July.

Powassan virus (POWV) activity in 2012

As of August 14th, four counties in two states (Minnesota and Wisconsin) reported human cases of POWV disease in 2012 [Figure 7 and Table 4]. Demographic and clinical characteristics of reported cases are described on page 10 [Table 5]. During the past month (July 14 – August 14), POWV activity has not been reported.

Figure 7. Powassan virus (POWV) activity reported to ArboNET, by state, United States, 2012 (as of August 14, 2012)

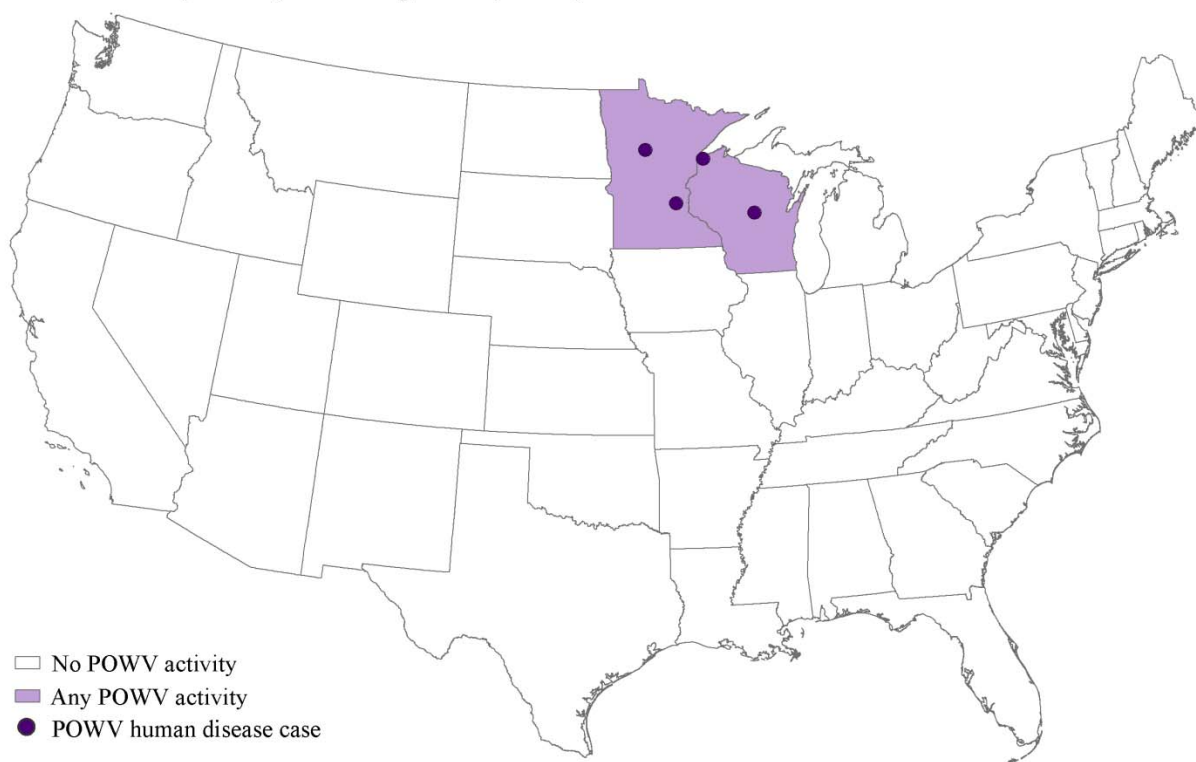


Table 4. Powassan virus (POWV) human disease cases reported to ArboNET, United States, 2012

	Neuroinvasive disease cases	Nonneuroinvasive disease cases	Total cases*	Deaths
Minnesota	2	--¶	2	--
Wisconsin	2	--	2	--
Totals	4	--	4	--

*Includes confirmed and probable cases.

¶None reported.

St. Louis encephalitis virus (SLEV) activity in 2012

As of August 14th, four counties in one state (Florida) reported SLEV activity in non-human species to ArboNET for 2012 [Figure 8]. To date, no human cases of SLEV disease have been reported. During the past month (July 14 – August 14), SLEV activity has been reported in one state (Florida).

Figure 8. St. Louis encephalitis virus (SLEV) activity reported to ArboNET, by state, United States, 2012 (as of August 14, 2012)



* Includes SLEV human disease cases, veterinary disease cases, and infections in mosquitoes, birds, and sentinel animals.

Table 5. Characteristics of reported cases of arboviral disease, United States, 2012 (as of 08/14/2012)

	WNV N=693		LACV N=17		POWV N=4	
	No.	(%)	No.	(%)	No.	(%)
Age group						
<20 years	32	(5)	17	(100)	0	(0)
20-39 years	132	(19)	0	(0)	0	(0)
40-49 years	112	(16)	0	(0)	1	(25)
50-59 years	158	(23)	0	(0)	1	(25)
≥60 years	259	(37)	0	(0)	2	(50)
Male sex	404	(58)	12	(71)	1	(25)
Onset of illness						
January	0	(0)	0	(0)	0	(0)
February	0	(0)	0	(0)	0	(0)
March	0	(0)	0	(0)	0	(0)
April	2	(1)	0	(0)	0	(0)
May	9	(1)	2	(12)	2	(50)
June	89	(13)	9	(53)	2	(50)
July	560	(81)	6	(35)	0	(0)
August	33	(4)	0	(0)	0	(0)
Clinical syndrome						
Nonneuroinvasive	287	(41)	3	(18)	0	(0)
Neuroinvasive						
Encephalitis	232	(34)	9	(53)	3	(75)
Meningitis	137	(20)	5	(29)	1	(25)
Acute flaccid paralysis [†]	37	(5)	0	(0)	0	(0)
Outcome						
Hospitalization	454	(66)	17	(100)	4	(100)
Death	26	(4)	1	(6)	0	(0)

WNV=West Nile virus; LACV=La Crosse virus; POWV=Powassan virus

[†]Thirty two WNV disease cases classified as acute flaccid paralysis also had encephalitis or meningitis.

About ArboNET

ArboNET is a national arboviral surveillance system managed by CDC and state health departments. In addition to human disease, ArboNET maintains data on arboviral infections among presumptive viremic blood donors (PVDs), veterinary disease cases, mosquitoes, dead birds, and sentinel animals. As with other national surveillance data, ArboNET data has several limitations that should be considered in analysis, interpretation, and reporting [Box].

Box: Limitations of ArboNET data

The following should be considered in the analysis, interpretation, and reporting of ArboNET data:

1. ArboNET is a passive surveillance system. It is dependent on clinicians considering the diagnosis of an arboviral disease and obtaining the appropriate diagnostic test, and reporting of laboratory-confirmed cases to public health authorities. Diagnosis and reporting are incomplete, and the incidence of arboviral diseases is underestimated.
2. Reported neuroinvasive disease cases are considered the most accurate indicator of arboviral activity in humans because of the substantial associated morbidity. In contrast, reported cases of nonneuroinvasive arboviral disease are more likely to be affected by disease awareness and healthcare-seeking behavior in different communities and by the availability and specificity of laboratory tests performed. Surveillance data for nonneuroinvasive disease should be interpreted with caution and generally should not be used to make comparisons between geographic areas or over time.
3. Provisional ArboNET data are provided to help track recent arboviral disease activity. However, these data may change substantially before they are finalized. Provisional data from the current year should not be combined with or compared to final data from previous years.

Additional resources

For additional arboviral disease information and data, please visit the following websites:

- CDC's Division of Vector-Borne Diseases:
<http://www.cdc.gov/ncezid/dvbd/index.html>
- National Notifiable Diseases Surveillance System:
http://www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis2011.htm
- U.S. Geological Survey (USGS):
<http://diseasemaps.usgs.gov/>
- AABB (American Association of Blood Banks):
www.aabb.org/programs/biovigilance/Pages/wnv.aspx